

WHAT IS CLAIMED IS:

1. (currently amended) An automatically adjusting annular jet mixer comprising:

a stationary hollow housing, and

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing while maintaining a constant system pressure.

2. (original) An automatically adjusting annular jet mixer according to Claim 1 further comprising:

said inner nozzle member attaching on one end to a pipe having a powder inlet opening where powder is introduced into the inner nozzle member,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow

supply water to flow via the nozzle opening to contact the powder which is flowing through the inner nozzle member.

3. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 2 further~~ comprising:

a stationary hollow housing

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said inner nozzle member attaching on one end to a pipe having a powder inlet opening where powder is introduced into the inner nozzle member,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact the powder which is flowing through the inner nozzle member.

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, means for pressurizing said upstream area with a regulated pressure, and said piston movably engaging an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area so that the movement of the inner nozzle member is in proportion to the variations in supply water pressure in the downstream area.

4. (original) An automatically adjusting annular jet mixer according to Claim 3 further comprising:

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening.

5. (original) An automatically adjusting annular jet mixer according to Claim 4 further comprising:

said housing provided with an outwardly expanding tapered portion located adjoining the inwardly tapered portion and located between the inwardly tapered portion and a mixture exit opening of the housing.

6. (previously amended) An automatically adjusting annular jet mixer comprising:

a stationary hollow housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said inner nozzle member attaching on one end to a pipe having a powder inlet opening where powder is introduced into the inner nozzle member,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow

supply water to flow via the nozzle opening to contact the powder which is flowing through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure, said piston movably engaging an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area,

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening,

said housing provided with an outwardly expanding tapered portion located adjoining the inwardly tapered portion and located between the inwardly tapered portion and a mixture exit opening of the housing,

a first helical groove provided in an external surface of said piston and extending between the upstream and downstream areas so

that supply water flowing through the helical groove serves as a lubricant between the external surface of said piston and the inner surface of the housing as the inner nozzle member moves axially within the housing.

7. (original) An automatically adjusting annular jet mixer according to Claim 6 further comprising:

an alignment member attached to said housing at one end of the upstream area, said alignment member having an arm that extends parallel to and adjacent the inner nozzle member, and a traveling pin that inserts through a traveling pin opening provided in the arm is retained within a groove provided in the surface of the inner nozzle member as a means of preventing the inner nozzle member from rotating within the housing as the inner nozzle member moves axially within the housing.

8. (original) An automatically adjusting annular jet mixer according to Claim 7 further comprising:

a second helical groove provided in an inner surface of said alignment member and extending between the upstream area and a drain opening that is provided extending through in the alignment

member and the housing so that regulated supply water flowing through the helical groove serves as a lubricant between the inner surface of the alignment member and the external surface of the inner nozzle member as the inner nozzle member moves axially within the housing.

9. (previously amended) An automatically adjusting annular jet mixer comprising:

a stationary hollow housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said inner nozzle member attaching on one end to a pipe having a powder inlet opening where powder is introduced into the inner nozzle member,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a

discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact the powder which is flowing through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure, and said piston movably engaging an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area,

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening, and

a pressure regulating valve providing supply water at a regulated pressure to the upstream area to pressurize the upstream area.

10. (currently amended) An automatically adjusting annular jet mixer comprising:

a hollow stationary mixer housing, and

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing while maintaining a constant system pressure,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member.

11. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 10~~ further comprising:

a hollow stationary mixer housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member, and

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, means for pressurizing said upstream area with a regulated pressure, and said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in proportional response to variations in supply water pressure in the downstream area.

12. (previously amended) An automatically adjusting annular jet mixer comprising:

a hollow stationary mixer housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure, said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area,

a first helical groove provided in an external surface of said piston and extending between the upstream and downstream areas so that supply water flowing through the helical groove serves as a lubricant between the external surface of said piston and the inner surface of the housing as the inner nozzle member moves axially within the housing.

13. (currently amended) An automatically adjusting annular jet mixer according to ~~Claim 11~~ further comprising:

a hollow stationary mixer housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, means for pressurizing said upstream area with a regulated pressure, and said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in proportional response to variations in supply water pressure in the downstream area, and

an alignment member attached to said housing at one end of the upstream area, said alignment member having an arm that extends parallel to and adjacent the inner nozzle member, and a traveling pin that inserts through a traveling pin opening provided in the arm is retained within a groove provided in the surface of the inner nozzle member as a means of preventing the inner nozzle member from rotating within the housing as the inner nozzle member moves axially within the housing.

14. (original) An automatically adjusting annular jet mixer according to Claim 13 further comprising:

a second helical groove provided in an inner surface of said alignment member and extending between the upstream area and a drain opening that is provided extending through in the alignment member and the housing so that regulated supply water flowing through the helical groove serves as a lubricant between the inner surface of the alignment member and the external surface of the inner nozzle member as the inner nozzle member moves axially within the housing.

15. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 11 further comprising:~~

a hollow stationary mixer housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, and said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow

supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, means for pressurizing said upstream area with a regulated pressure, and said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in proportional response to variations in supply water pressure in the downstream area, and

said discharge end of said inner nozzle member provided with a tapered section that cooperates with an inwardly tapered portion of the housing to form the nozzle opening.

16. (previously cancelled)
17. (previously amended) An automatically adjusting annular jet mixer according to Claim 15 further comprising:

said housing provided with an outwardly expanding tapered portion located adjoining the inwardly tapered portion and located between the inwardly tapered portion and a mixture exit opening of the housing.

18. (currently amended) An automatically adjusting annular jet mixer ~~according to Claim 11 wherein the means for pressurizing the upstream area at a constant pressure further comprises~~ comprising:

a hollow stationary mixer housing,

a hollow inner nozzle member that moves axially within the housing along a centerline of the housing in proportional response to variations in pressure of supply water flowing to the housing,

said housing having at least one supply water inlet that admits supply water to a downstream area located between the housing and the inner nozzle member, a nozzle opening continuous with said downstream area, said nozzle opening formed between a discharge end of the inner nozzle member and the housing to allow supply water to flow via the nozzle opening to contact powder which flows through the inner nozzle member,

an upstream area formed between the housing and the inner nozzle member and separated from the downstream area by a piston, said piston encircles and attaches to the inner nozzle member, said upstream area pressurized with a constant pressure, said piston movably engages an inner surface of said housing so that together the piston and inner nozzle member automatically move axially within the housing in response to variations in supply water pressure in the downstream area,

a pressure regulating valve providing supply water at a regulated pressure to the upstream area as a means for pressurizing the upstream area at a regulated pressure ~~to pressurize the upstream area.~~

19. (cancelled)